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ABSTRACT

This paper reports on the relationship between English language fluency and reading achievement in California sixth grade students. The interaction between fluency and social class was examined. This interaction was found to be similar for students who spoke English only and for Spanish speakers who were fluent in English. It was diminished for limited English proficient students. This may have been the result of the criteria applied for this classification. The effects of fluency on performance in various reading skills was examined. Overall differences in performance were examined and skills which were particularly difficult for limited and fluent English proficient groups were identified. (Author)

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Reading Achievement and English Language Proficiency in the California Assessment Program Sixth Grade Test

by

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ABSTRACT

This paper reports on the relationship between English language fluency and reading achievement in California sixth grade students. The interaction between fluency and social class was examined This interaction was found to be similar for students who spoke English only and for Spanish speakers who were fluent in English. It was diminished for limited English proficient students. This may have been the result of the criteria applied for this classification. The effects of fluency on performance in various reading skills was examined. Overall differences in performance were examined and skills which were particularly difficult for limited and fluent English proficient groups were identified.

INTRODUCTION

Samuel Johnson, the great British wit and man of letters, said that the only end of writing was to enable readers better to enjoy life or better to endure it. The lack of reading skills in present day society can make life more difficult to enjoy and more difficult to endure.[1] The importance of reading has stimulated research on the acquisition of reading skills, not only in native speakers, but in those who are acquiring a second language, as well. California schools were attended by 1,045,186 Hispanic students in the 1981-1982 school year. This was 25.8 percent of the total enrollment. (California, 1982a) These enrollments have been increasing 12 to 15 percent each year for the last four years and will probably continue increasing at this rate. (California, 1982b) There is widespread concern that these students receive appropriate and effective instruction in reading as well as in other areas. Well articulated theories, supported by empirical data are needed to help plan bilingual curriculum and

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[1] This article was originally written for presentation at the annual meeting of the American Educational Research Association, Montreal, 1983. Special thanks are owed to Dale Carlson of the California Department of Education for his encouragement. The views expressed here are not necessarily those of the California Department of Education.

instruction. The goal of this paper is to contribute some preliminary empirical results to bilingual education research. The first question addressed here regards the effect of the interaction between social class and English language fluency on reading achievement. The second question regards the effect of English language fluency on performance in various reading skills.

There have been several recent reviews of research and thought on bilingual instruction. According to a California (1982c) study of basic principles for the education of language minority students, desirable bilingual educational goals include: attainment of oral English proficiency; achievement in academic areas; and positive psychosocial adjustment. Academic achievement is recognized here as an important educational outcome, although not the only one. Current thinking indicates that the three goals are intertwined. Success in one depends on success in the other two. Paivio and Begg (1981) noted in their review of research on bilingualism the importance of social and motivational factors for acquisition and learning. Cummins (1979) presented evidence that evaluations of bilingual programs are not interpretable unless they take into account interactions between social context, school programs and child input. The National Assessment of Educational Progress (1982) found that children of parents who spoke a language other than English had more educational

difficulties than other children. The degree of these difficulties varied widely with the socioeconomic status of parents. Hakuta and Cancino (1977), in their review of research trends in second language acquisition, documented an increasing emphasis on the social context of language use.

Reading instruction involves more than taking account of social context. Assessment of reading necessarily involves the assessment of its component skills. Theories of reading, e.g. Frase (1975), Rothkopf (1976), Calfee (1977) and Kintsch and van Dijk (1978) underline its complex and multifaceted nature. Comprehending a text involves the application of numerous cognitive skills. Johnston (1981) argues for a theoretically justified set of skills which would provide an effective framework for reading assessment.

The legislative mandate of the California Assessment Program (CAP) is to report on achievement in California public schools and to investigate factors which influence it. CAP introduced a new test, The Survey of Basic Skills: Grade 6, in the spring of 1981. In addition to reporting a total reading score, the test permits diagnostic scores for 29 different reading skills. Comprehension skills are heavily emphasized. Student background information is collected during testing, including a measure of social class based on parent occupation, a classification of English language fluency, and an indication of other

languages spoken. The many diagnostic scores and the student background information makes the CAP test a useful instrument for examining language minority student reading achievement in California. It must be emphasized that achievement testing is only one of many ways of looking at bilingual programs. The statistics reported here are intended merely to supplement these other methods and not to replace them.

Method

Data source. The Survey of Basic Skills: Grade 6 consists of 1,240 test items, including 418 reading items, 342 written language items, and 480 mathematics items. The test has been divided into 40 unique forms. Each student takes one form made up of 9 written language items, 12 mathematics items and 10 reading items. Each test form contains items from all major skill areas, and a balance is maintained between easy and difficult items.

The reading section contains questions from six skill areas: vocabulary; literal comprehension; inferential comprehension; interpretive comprehension; critical/applicative comprehension; and study locational. Decisions about the relative emphasis and breadth of content of these skill areas were made by the Reading Advisory Committee, a group of reading specialists representing a cross section of geographical regions, educational institutions and professional groups throughout California.

The committee members considered information from field reviews of preliminary test content specifications and relevant documents, such as California's (1980) Reading Framework

Specific skills tested and the number of items per skill are shown in Table 1. All vocabulary items are based on words which are used and underlined in an accompanying test passage. This was done to enable students to use the context of a passage in answering questions, and to avoid fragmenting and isolating these skills from realistic reading situations. Reading passages were edited to appropriate levels of readability. More complete descriptions of skills can be found in California (1982d).

Sample.

Criteria for classifying students according to English language proficiency were as follows.

- English only (EO). Students whose native language was English, even if they spoke a different language were in this category. This included all students who spoke only English, even if they they did not speak it fluently.
- Fluent English proficient (FEP). These were students whose primary language was other than English but who had clearly developed English language skills of comprehension, speaking, reading and writing necessary to receive instruction only in English.

- Limited English proficient (LEP). Students were classified as limited English proficient if they had been classified as limited English proficient using one of the state approved English oral language tests. These students did not have clearly developed language skills needed to receive instruction only in English.
- Non-English speaking (NES). These students were classified using one of the state approved oral language tests. These students were able to communicate in their primary language only, or communicated in English at a level which did not permit them to participate meaningfully in an educational setting where English is used.

The grade 6 test was administered to 293,281 California public school students in the spring of 1982 under standardized conditions. These included 35,624 Spanish FEP, 8,172 Spanish LEP and 4,301 spanish nes students. Those classified as speaking English only, included for comparison purposes in this study, numbered 221,613. Non-English speaking students were not tested and are not considered here.

According to California's (1982b) language census, conducted independently of CAP testing, there were 30,672 Spanish FEP students and 17,328 Spanish LEP students. The CAP count of FEP students is greater than the census count by 4,952 students. By definition, the census count of LEP

students includes both the CAP LEP and NES categories. When this is taken into account there is a discrepancy of 4,855 students between the two counts. This indicates the possibility of a selection bias in the CAP scores for LEP students. If the less able LEP students were not tested it is likely that the scores are somewhat higher than they would have been, had all LEP students been tested. On the other hand it could be that the "missing" LEP students were reclassified as FEP in the census count, thus explaining the difference between the CAP and the census numbers of FEP students. If this is so, and these students were somewhat more able than the other LEP students, the LEP achievement data are somewhat lower than what would have been expected.

Criteria for identifying students' socioeconomic status were based on parent occupation. Teachers indicated the category which corresponded most closely to the student's father, mother (if she was the breadwinner) or guardian. In case of unemployment, where a job is being sought, the teacher indicated the category which best represented the lifetime occupational level of the father or mother. The following four categories were used: 1) executives, professionals and managers; 2) semi-professionals, clerical and sales workers; 3) skilled and semi-skilled employees; 4) and unskilled employees.

Analyses. Total reading percent correct was broken down by parent occupation and plotted in Figure 1. This

permitted the examination of the effect of the interaction of parent occupation and fluency on achievement. Proportions correct for items within each fluency subgroup were calculated and aggregated to obtain averages for each skill. These were grouped by skill area and plotted in Figures 2-7. The purpose of this analysis was to examine differences in performance on different skills for the fluency subgroups.

Results

The breakdown of total reading scores by parent occupation is shown in Figure 1. The usual main effect of social class was present, with students from professional backgrounds scoring higher than students from unskilled backgrounds. The curves for the EO and the FEP students were nearly parallel, with the FEP curve about eight points lower. The two curves converged slightly for students from unskilled backgrounds to a difference of about 4.5 points. LEP students scored much lower than the other two groups. There was only a slight difference in the achievement of LEP students from professional backgrounds compared to those from semiprofessional backgrounds. Average LEP scores did decrease for students from skilled and unskilled backgrounds. Generally, the decreases in LEP scores were not as great as those of EO or FEP scores.

Profiles of achievement on individual skill areas were shown in Figures 2-7. A summary of the average scores

including ranks of skills within areas is shown in Table 2. Each figure displayed the skills in one of the six areas tested. The figures had certain features in common. There was the expected main effect of fluency. EO skill averages were always the highest and LEP skill averages were always the lowest. FEP scores tended to be closer to EO scores than to LEP scores. The FEP and EO profiles generally resembled each other. The LEP profiles, by contrast, diverged for certain skills.

The profiles for vocabulary skills are shown in Figure 2. The average percent correct scores for this area were: EO 72.4; FEP 59.9; and LEP 43.9. "Using context with multiple meaning words" was the easiest skill for all three groups. EO and FEP averages were lowest for "social studies word meaning," and the lowest LEP average was in "science word meaning." The relative performance of LEP students on "science word meaning," 39.3, was below the LEP vocabulary average, but the corresponding FEP score of 60.5 and the EO score of 74.3 were above their averages for this area. This relative decrease in LEP performance on science vocabulary is illustrated by the profiles in Figure 2.

The score averages for literal comprehension skills are shown in Figure 3. The averages for this area were: EO 78.9; FEP 68.7; and LEP 50.7. "Sequence" was the most difficult skill for all three groups. EO performance on "literal details from a single sentence" was slightly lower

than performance on "literal details from two or more sentences." This ranking was reversed for the FEP students, and the reversal was more pronounced for LEP students.

Skill averages for the inferential comprehension area are shown in Figure 4. The average scores were: EO 70.2; FEP 58.0; and LEP 41.9. These averages were lower than those obtained in any other area by the three groups. The most difficult skill for each group was "following organization." The easiest skill for EO students was "drawing conclusions from overall meaning." This skill ranked third easiest for FEP and LEP students. Other skills showing a similar pattern were "drawing conclusions from details," (fifth easiest for EO, fifth for FEP and sixth for LEP) and "putting information together," (sixth ranked for EO, and seventh for FEP and LEP). A somewhat different pattern of change in rank existed for "making comparisons and contrasts," (seventh easiest for EO, sixth for FEP and fifth for LEP) and "main ideas," (third easiest for EO, second for FEP, and first for LEP). These changes in relative difficulty are illustrated by the profiles.

Profiles for the area of interpretive comprehension are shown in Figure 5. The average scores were: EO 77.7; FEP 65.4; and LEP 46.0. The easiest skill for all groups was "identifying setting," and the most difficult was "sensing mood." "Understanding dialogue," which was the second easiest skill for both EO and FEP students ranked fifth for

LEP students. By contrast, "analyzing character" ranked second for LEP students and fourth for both FEP and LEP students.

The critical/applicative profiles are shown in Figure 6. The average scores were: EO 71.4; FEP 57.7; and LEP 40.1. "Detecting purpose" was the easiest skill for all three groups. The most difficult skills in this area were "detecting attitude" for EO students and "separating fact from opinion" for FEP and LEP students. This change in ranking is illustrated by the profiles.

The two study locational skills are shown in Figure 7. The averages were: EO 86.8; FEP 78.3; and LEP 62.6. Of these, the easier for all groups was "maps, graphs and charts." The skill, "reference materials," was relatively more difficult for FEP and LEP students.

Discussion

Reading scores for EO, FEP and LEP students, shown in Figure 1, were well above chance for all levels of parent occupation. All test questions were in a four option multiple choice format. The expected chance score in this situation would be 25 percent. LEP performance on some of the inferential comprehension skills approached the chance level, although overall performance was well above chance. These scores are low enough that they could represent a discouraging academic experience and could have negative effects on attitudes and motivation in school. Most of the

scores are high enough, from a measurement perspective, that they probably are an accurate reflection of Spanish LEP achievement.

Parent occupation was less strongly related to achievement for LEP students than for the other two groups. For the two highest categories of parent occupation there was only a small difference in scores, and the overall decrease in LEP scores was about half that of the EO and FEP students. There are several possible reasons for this. One possibility is that the test was too hard for the LEP students, that there was a major floor effect. Under this hypothesis student achievement at the low end of the scale was not being accurately measured. Two facts argue against this hypothesis. The first is that the LEP scores average well above the chance level, indicating that the test was not too hard. Furthermore, under the floor effect hypothesis one would expect the relationship to be weaker for the lower scoring students. Opposed to this is the lack of difference in scores between the two higher scoring LEP groups. The two lower scoring LEP groups differ much more. Another hypothesis is that the range of LEP achievement is just more limited than that of the other two groups. This probably reflects the criteria for placing students in these categories. To be classified as LEP the students must meet certain performance standards on a state approved oral language proficiency test. This implies an upper bound on

achievement for LEP students. Those who exceed that bound are classified as FEP, and this category has no such artificial upper bound. For this reason the achievement range of FEP students should be greater than the range of LEP students.

FEP performance was consistently below that of EO students. This was true overall, for each skill measured, and for each category of parent occupation. This is an apparent contradiction of findings that show an academic advantage for individuals who are proficient both in their native language and in a second language. To resolve this contradiction it would be necessary to know more about district practices in classifying students, and about literacy in their native language as well as in English. Certainly, more research is needed on this point.

The results in Figure 1 appear to confirm the National Assessment of Educational Progress finding that the educational difficulty of language minority students varied widely with social class. Social class is generally conceded to be strongly related to group achievement, and there was no exception here. The FEP curve was virtually parallel to the EO curve, with both curves showing large decreases in achievement corresponding to decreases in social class. The decrease for LEP students was evident, but only about half that of the others. A caution in interpreting this result is that social class is only one of

many factors in a student's social environment, and that parent occupation is only one indicator of social class.

A comment is needed on the interpretation of the skill profiles. Achievement scores are reported here as percents correct. This means that the adequacy of any particular score is measured against the content of the test items which contribute to the score. A judgement is made as to what percentage of sixth graders should be expected to have mastered that content. In Figures 2-7 the EO profiles have been provided as a comparison standard. This does not necessarily imply that EO performance is acceptably high, or unacceptably low. The EO profile is convenient standard in that it reflects the average level of mastery which actually exists in a population of English speakers. In making comparisons it is not enough to note that FEP performance is lower than that of EO, and LEP is lower than FEP. That is to be expected as a matter of the definition of fluency. More interesting are the changes in the shapes of the profiles, the relative changes in difficulty of skills. These changes signal the presence of interactions, places where a particular skill combines with low fluency to produce relatively lower performance than would have been expected from the skill and the level of fluency considered separately.

The profiles for the six skill areas had certain features in common. Some skills were relatively easy for all groups,

and other skills were relatively difficult. An example of a uniformly easy skill would be "using context with multiple meaning words" in the vocabulary area. "Sensing mood" is an example of a uniformly difficult skill in the interpretive area. A third class of skills interacted with fluency, becoming increasingly more difficult with decreasing fluency. An example of this was "drawing conclusions from details" in the inferential area. EO students found this easier than "making comparisons and contrasts," LEP students found it more difficult. Presumably this three way classification of skills should have implications for bilingual reading programs. Those skills which interact markedly with fluency should receive extra consideration.

An example of a skill that was relatively more difficult for LEP students than others was "understanding dialogue" in the interpretive area. A plausible reason for this is that dialogue involves additional rules for conveying meaning not found in purely descriptive prose. Examples of this are direct speech, indirect speech, certain types of deixis uniquely associated with conversation, and additional punctuation. This large change in rank, from second for EO students to fifth for LEP students could explain the apparent anomaly that "analyzing character" was relatively more difficult for EO than for LEP students. It is likely that the large increase in difficulty of "understanding dialogue" has made other skills relatively more easy, i.e.

has bumped them up in rank. The other cases of skills which appear relatively easier for LEP students are probably artifacts of this bumping process. A possible exception to this may be the "maps, graphs and charts" skill in the study locational area. To the extent that this skill involves less actual dependence on language fluency performance on it is relatively improved for LEP students. It is likely, as well, that "reference materials," an area in which LEP students probably have little experience, was relatively more difficult.

What might have been responsible for the differences of difficulty and skill by fluency interactions? To attempt an answer to that question one must consider various theories of reading and ways in which they could apply to language minority students. Only the barest outline of such an approach can be adumbrated here. A common assumption of cognitive theories of reading is that skills are organized in a hierarchy. Output from lower level skills is needed as input for higher level skills. The four skills in the area of literal comprehension can be modeled in this way. Comprehending details from a single sentence would be a necessary condition for comprehending details from two or more sentences. Understanding pronoun references may require the integration of information from two or more sentences. Comprehending sequence usually requires successful application of the previous skills. A prediction

that can be made on the basis of such a theory is that complex skills are more difficult. When compared with "comprehension of details from a single sentence" EO students scored about the same, FEP students scored about 1.4 points lower, and LEP students scored about 2.9 points lower. This can be interpreted as a difficulty for LEP students in combining information from two or more sentences. With more complex skills, which depend more heavily on this ability, achievment decreases. One caution is that it is quite difficult and controversial to define such hierarchies. Experiments carefully designed around particular theories of reading would be needed to produce more definitive results.

Conclusions

Planning instruction for language minority students presents special challenges. The large and growing language minority population brings these challenges into even sharper focus for the schools of California. A first step to meeting these challenges is to construct workable theories of bilingual instruction, based on objective data. The social context of education has been recognized as an important factor and the results here showing the effects of parent occupation and fluency confirm that. The diagnostic profiles shown here confirm the validity and usefulness of a skills approach to reading assessment for language minority students. The main reason for this has to do with the large

number of skills reported. These skills are logically organized into related clusters. Within any one group of skills it is possible to pinpoint relative strengths and weaknesses. To do this it is helpful to have a standard profile of performance, such as that of the EO students. It is not enough to locate just the high and low scores LEP students. With this knowledge programs can be designed to maintain strengths and remediate weaknesses.

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TABLE 1

Item Counts for Reading Skill Areas

I. Vocabulary	70
A. Prefixes roots and suffixes	16
B. General word meaning	13
C. Science word meaning	11
D. Social studies word meaning	13
E. Using Context with multiple meaning words	17
II. Literal comprehension	62
A. Literal details from a single sentence	14
B. Literal details from two or more sentences	17
C. Pronoun references	16
D. Sequence	15
III. Inferential comprehension	122
A. Main ideas	16
B. Cause and effect	15
C. Following organization	16
D. Putting information together	15
E. Predicting outcomes	18
F. Making comparisons and contrasts	17
G. Drawing conclusions from details	16
H. Drawing conclusions from overall meaning	14
IV. Interpretive comprehension	79
A. Analyzing character	18
B. Identifying setting	12
C. Summarizing plot	13
D. Understanding dialogue	12
E. Sensing mood	12
F. Understanding figurative language	12
V. Critical/applicative comprehension	62
A. Detecting author's attitude	12
B. Detecting author's purpose	19
C. Separating fact from opinion	16
D. Applications to different context	15
VI. Study locational skills	30
A. Reference materials	15
B. Maps graphs and charts	15

TABLE 2

Scores of LEP FEP and EO Students

SKILL	EO	RANK	FEP	RANK	LEP	RANK
VOCABULARY						
PREFIXES, ROOTS AND SUFFIXES	69.5	4	57.4	4	43.7	3
GENERAL WORD MEANING	73.9	3	61.3	2	44.4	2
SCIENCE WORD MEANING	74.3	2	60.5	3	39.3	5
SOCIAL STUDIES WORD MEANING	63.7	5	52.0	5	39.3	4
USING CONTEXT - MULTIPLE MEANING WORDS	80.7	1	68.4	1	52.9	1
LITERAL COMPREHENSION						
LITERAL DETAILS FROM A SINGLE SENTENCE	82.0	2	74.2	1	55.3	1
LITERAL DETAILS - TWO OR MORE SENTENCES	82.2	1	72.8	2	52.4	2
PRONOUN REFERENCES	76.7	3	65.1	3	49.3	3
SEQUENCE	74.8	4	63.4	4	45.6	4
INFERENTIAL COMPREHENSION						
MAIN IDEAS	75.9	3	64.8	2	48.6	1
CAUSE AND EFFECT	78.4	2	66.6	1	46.8	2
FOLLOWING ORGANIZATION	60.4	8	48.6	8	34.5	8
PUTTING INFORMATION TOGETHER	65.5	6	52.2	7	35.0	7
PREDICTING OUTCOMES	71.9	4	59.8	4	43.5	4
MAKING COMPARISONS AND CONTRASTS	62.8	7	52.6	6	41.2	5
DRAWING CONCLUSIONS FROM DETAILS	68.0	5	54.9	5	39.3	6
DRAWING CONCLUSIONS FROM OVERALL MEANING	78.5	1	64.2	3	46.1	3
INTERPRETIVE COMPREHENSION						
ANALYZING CHARACTER	78.4	4	66.1	4	46.9	2
IDENTIFYING SETTING	80.6	1	70.8	1	55.1	1
SUMMARIZING PLOT	76.2	5	63.9	5	45.6	4
UNDERSTANDING DIALOGUE	80.2	2	67.1	3	45.0	5
SENSING MOOD	70.3	6	56.0	6	37.0	6
UNDERSTANDING FIGURATIVE LANGUAGE	80.2	3	68.7	2	46.6	3
CRITICAL APPLICATIVE COMPREHENSION						
DETECTING ATTITUDE	69.1	4	55.3	3	38.5	3
DETECTING PURPOSE	75.5	1	63.0	1	45.7	1
SEPARATING FACT FROM OPINION	70.6	2	52.9	4	34.2	4
APPLICATIONS TO DIFFERENT CONTEXT	70.4	3	59.5	2	41.8	2
STUDY LOCATIONAL						
REFERENCE MATERIALS	84.1	2	74.5	2	56.0	2
MAPS, GRAPHS AND CHARTS	89.5	1	82.0	1	69.2	1

Figure 1

READING ACHIEVEMENT OF SPANISH SPEAKING STUDENTS
BROKEN DOWN BY FLUENCY AND PARENT OCCUPATION

ELF	SES	_FREQ_	READING
FLUENT ENGLISH	PROFESSIONAL	929	82.15
	SEMI-PROFESSIONAL	2411	75.79
	SKILLED	13836	69.31
	UNSKILLED	14614	63.21
LIMITED ENGLISH	PROFESSIONAL	71	56.76
	SEMI-PROFESSIONAL	209	57.03
	SKILLED	1922	51.49
	UNSKILLED	4661	47.05
ENGLISH ONLY	PROFESSIONAL	43986	89.85
	SEMI-PROFESSIONAL	50765	83.84
	SKILLED	85271	77.48
	UNSKILLED	29701	67.89

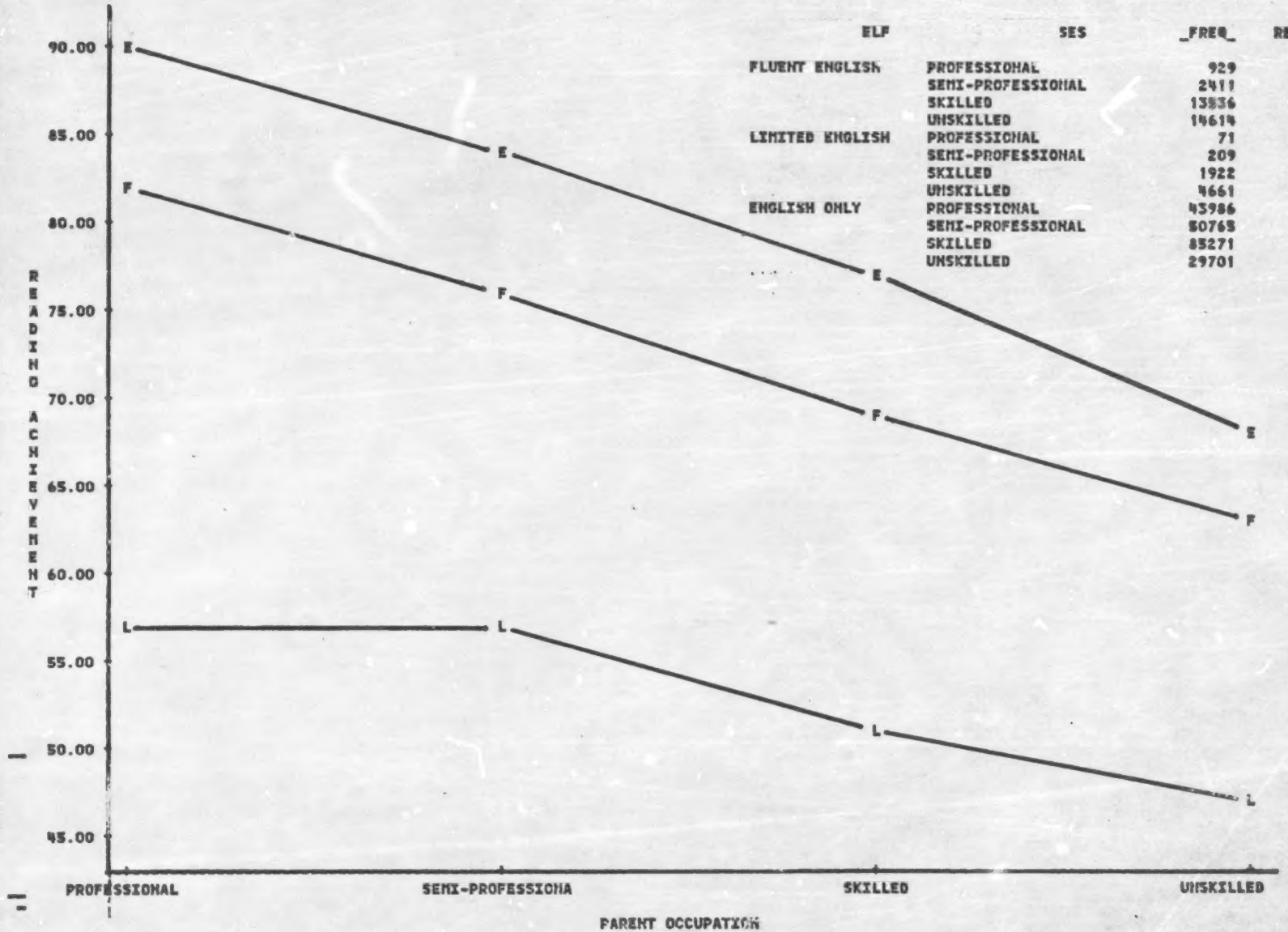

FIGURE 2
PERFORMANCE OF LEP AND FEP SPANISH SPEAKING STUDENTS
COMPARED WITH STUDENTS WHO SPEAK ENGLISH ONLY
AREA=VOCABULARY

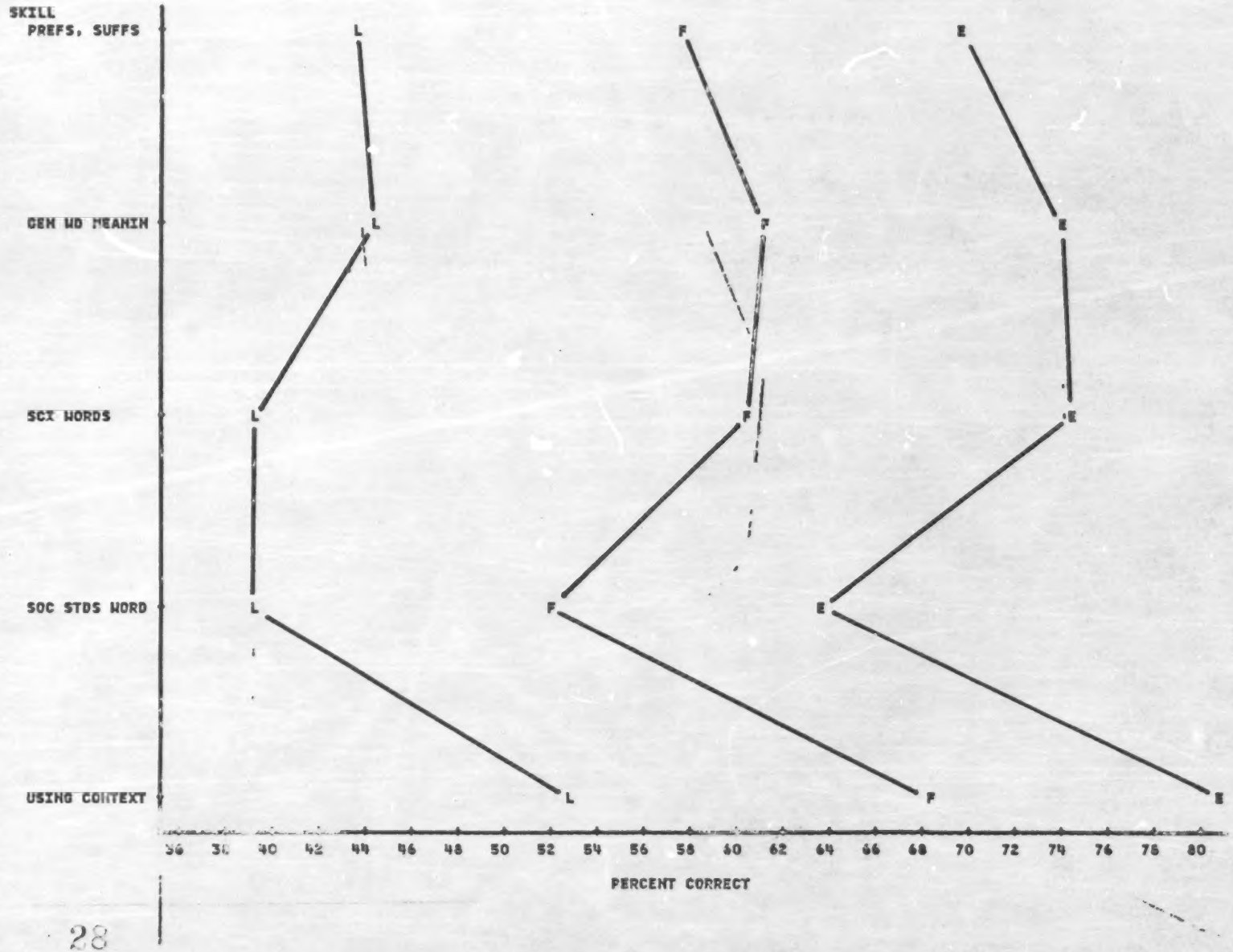

FIGURE 3
PERFORMANCE OF LEP AND FEP SPANISH SPEAKING STUDENTS
COMPARED WITH STUDENTS WHO SPEAK ENGLISH ONLY
AREA=LITERAL COMPREHENSION

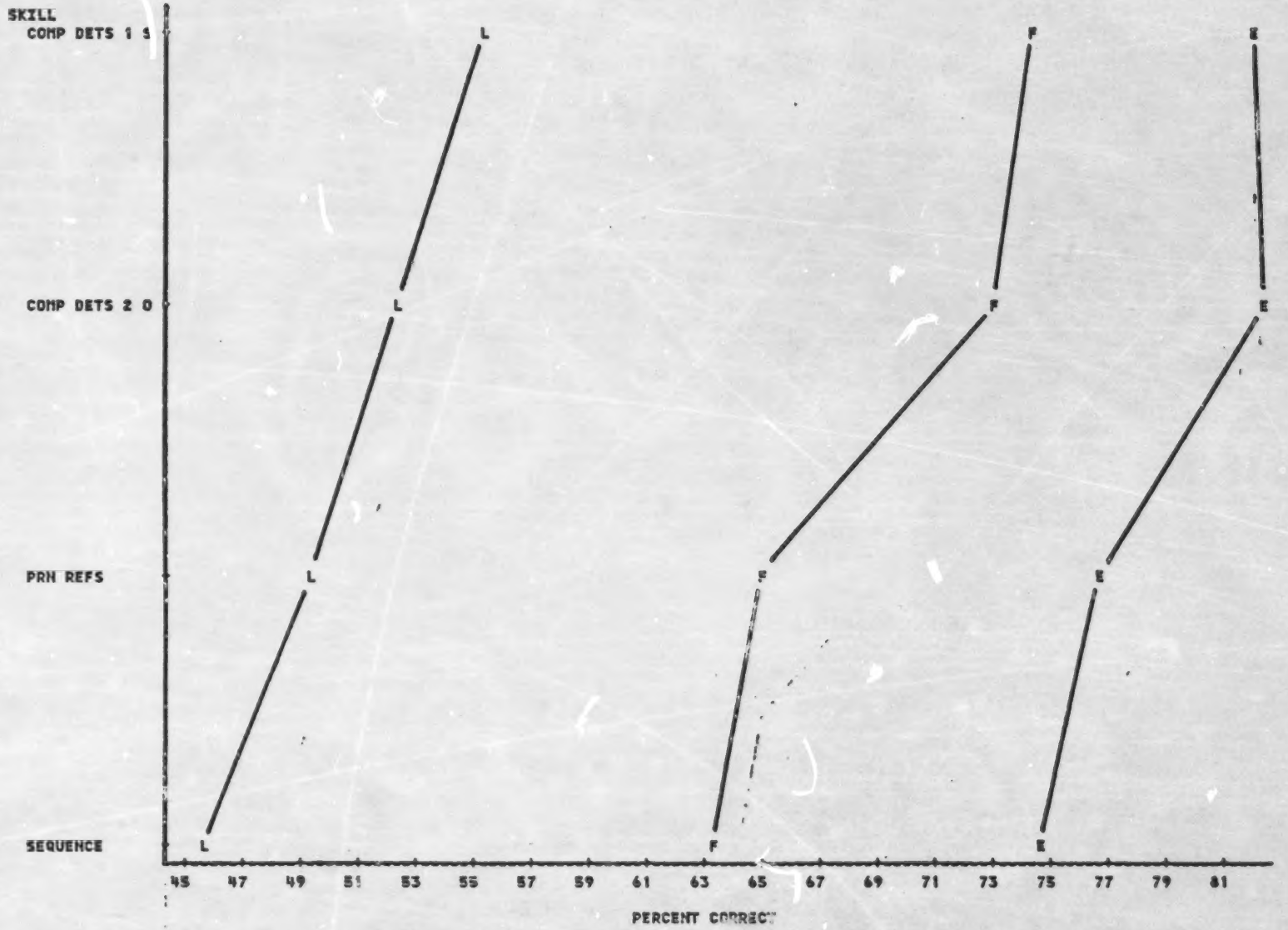

FIGURE 4
PERFORMANCE OF LEP AND FEP SPANISH SPEAKING STUDENTS
COMPARED WITH STUDENTS WHO SPEAK ENGLISH ONLY
AREA=INFERENTIAL

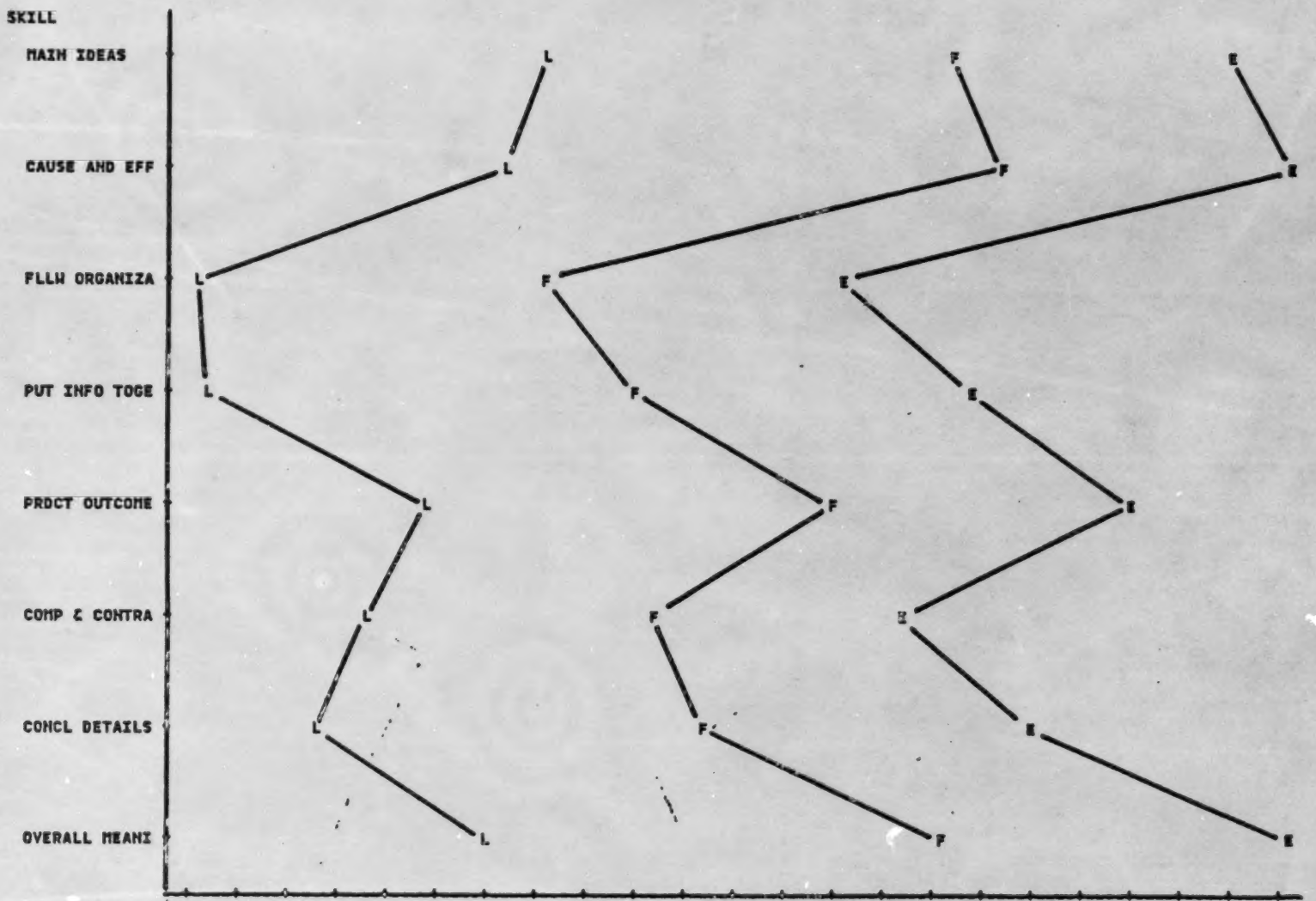

FIGURE 5
PERFORMANCE OF LEP AND FEP SPANISH SPEAKING STUDENTS
COMPARED WITH STUDENTS WHO SPEAK ENGLISH ONLY
AREA=INTERPRETIVE

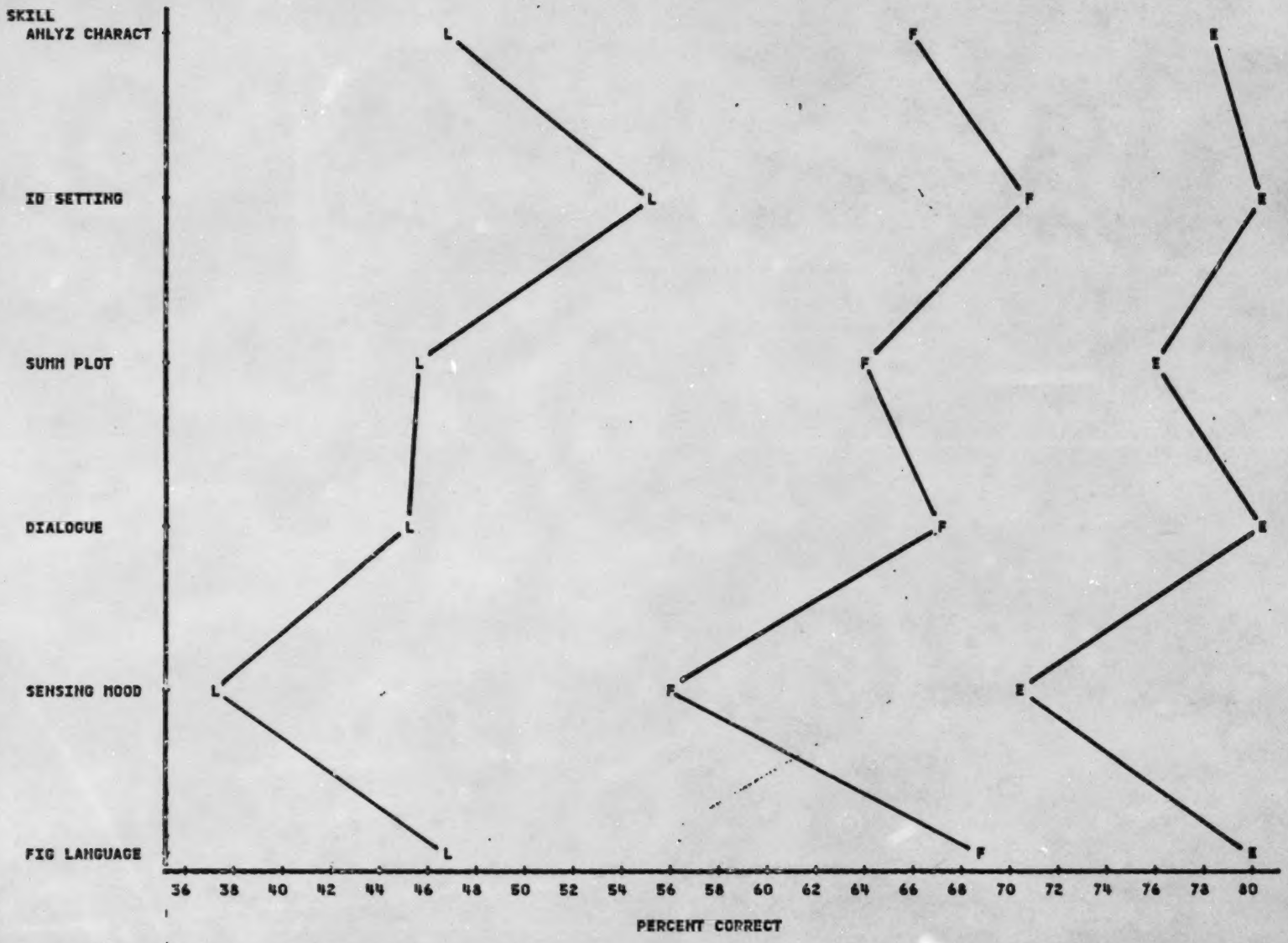

FIGURE 6
PERFORMANCE OF LEP AND FEP SPANISH SPEAKING STUDENTS
COMPARED WITH STUDENTS WHO SPEAK ENGLISH ONLY
AREA=CRITICAL/APPLICATIVE

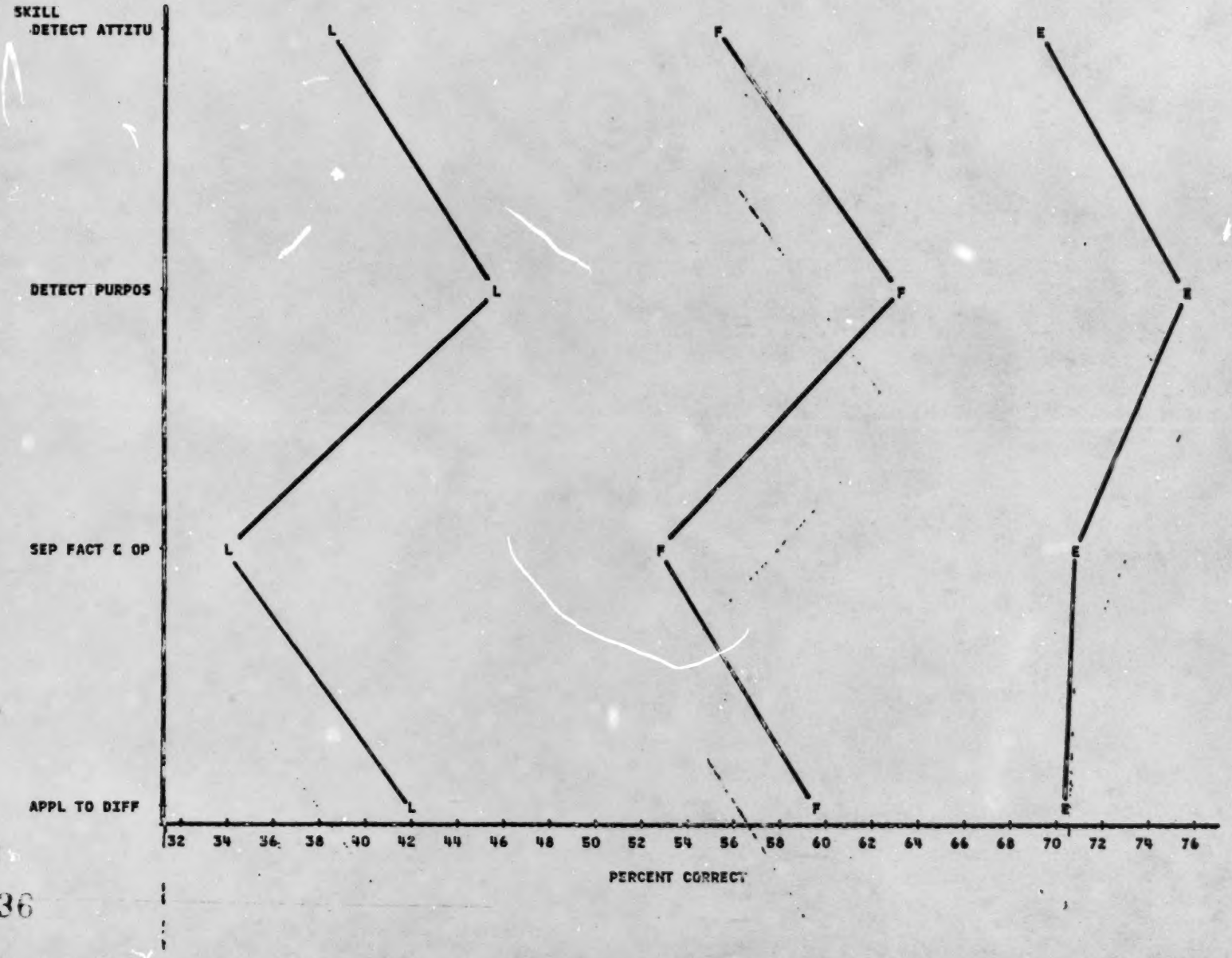
SKILL
DETECT ATTITU
DETECT PURPOS
SEP FACT & OP
APPL TO DIFF
L
F
E
32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76
PERCENT CORRECT

FIGURE 7
PERFORMANCE OF LEP AND FEP SPANISH SPEAKING STUDENTS
COMPARED WITH STUDENTS WHO SPEAK ENGLISH ONLY
AREA=STUDY LOCATIONAL